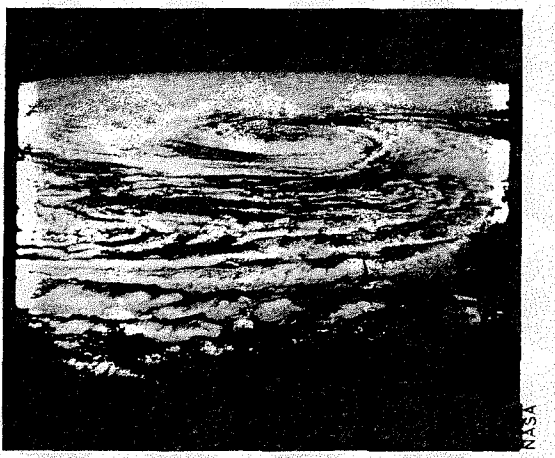
Creation/Evolution



How are storms evidence against the creationist view of the second law of thermodynamics?

(See articles beginning on page 5.)

Issue IV

CONTENTS

Spring 1981

ARTICLES

1 $5000 Reward and a Challenge to Evolution *by R. G. Elmendorf*

5 Biological Evolution and the Second Law *by William Thwaites and Frank Awbrey*

8 Creationist Misunderstanding, Misrepresentation, and Misuse of the Second Law of Thermodynamics *by Stanley Freske*

17 Do Gaps in the Fossil Record Disprove Descent with Modification? *by Niles Eldridge*

20 Moon and Spencer and the Small Universe *by Robert Schadewald*

REPORTS

23 Creationists Embarrassed in Oklahoma *by Frank J. Sonleitner*

27 New Creationist Bills, Resolutions, and Court Cases Appear Nationwide

33 Creationism and Evolution: Organizing a Symposium *by David Kraus and Jerry Resnick*

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Is It Time to Renew Your Subscription to *Creation/Evolution*?

If you joined us in the beginning, with the first issue, this issue is your last, unless you renew *now!*

If you joined us with the second issue, the *next* issue will be your last, and you should renew early to ensure that *Creation/Evolution* keeps coming without interruption.

You may use the coupon at the back of this issue or just send us a brief note with your check. We will know how many more issues are due you and see to it you get every one you pay for.

So, even if you don't quite remember when your subscription began, renew now. Our records show where you stand and we'll see that *Creation/Evolution* continues to come to you every quarter.

You know that *Creation/Evolution* is the only journal of its kind—the only one dealing specifically with the creation-evolution controversy, answering creationist arguments in all fields: scientific, educational, legal, political, historical, and religious. And you know that *Creation/Evolution* keeps you up-to-date on courtroom, legislative, and school board battles and informs you about the nature of creationist books and teaching aids.

In this issue, for example, we go in depth into the second law of thermodynamics, answering creationist misunderstandings and, perhaps deliberate, misrepresentations of the facts. We also report the latest news from the battle lines. So much is happening right now as the spread of creationism increases that you need to keep up to date.

So, please renew your subscription today! Our new rates are explained below and on the coupon at the back of this issue.

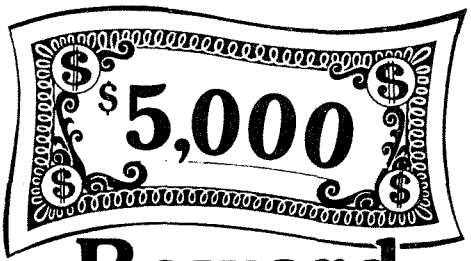
Creation/Evolution is a nonprofit publication dedicated to promoting evolutionary science. This journal is issued quarterly with the following subscription rates: annual (four issues), $8.00; Canadian or Mexican addresses, $9.00; foreign air mail, $13.00. Individual issues, including back issues, are $2.50. Please send subscription requests, letters, changes of address, requests for information on reprint rights, article proposals, and other inquiries to:

Creation/Evolution
P.O. Box 5
Amherst Branch
Buffalo, NY 14226

Staff: Editor, Frederick Edwords; Managing Editor, Philip Osmon; Consulting Editor, Christopher Weber.

CREATION/EVOLUTION IV (Volume 2, Number 2)

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



Reward

And A Challenge To Evolution!

The undersigned will pay *$5,000 in cash* to the first person who can show that evolution is scientifically *possible.*

It is *not* necessary to show evolution happening—only that it *can* happen in the present, real world known by science.

What happened in the past, before scientific records began, is, of course, not a matter of science, but of speculation—or religious faith.

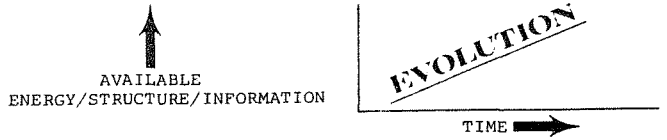
To collect the $5,000, document how the general "theory" of evolution can operate at the same time, in the same world as the first and second laws of thermodynamics.

It appears that evolution is scientifically *impossible* because of its direct conflict with these basic and universal laws, and the purpose of this challenge is to determine if sound evidence can be produced to enable evolution to survive this important scientific challenge. If this cannot be done, it means that *evolution is finished, as far as its claim to be "scientific" is concerned.*

Evolution is here defined as a real, natural, self-caused, continuing, uphill process—involving energy, structure, and information—which goes from disorganized to organized, from random to ordered, from lower to higher, from simple to complex, from atom to amoeba, from molecules to man.

In short, the fundamental thermodynamic direction of evolution is *uphill.* In graphical terms, evolution looks like this:

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED



It is believed that *all* uphill processes (photosynthesis, growth, etc.) are local and temporary, and *all* require a creative trio of prerequisites in order to operate:

1. *Energy:* an appropriate outside source of energy (it must be an open system, usually assumed in evolution).
2. *Energy Conversion Machine:* an appropriate structure or mechanism to utilize and transform the above energy.
3. *Intelligence:* an intelligent information and control system to direct the machine (found only in life).

The object is to find a *natural* process in which *available energy, structure, and information increase with time—without requiring prior and higher energy, structure, and information.*

Such a process would demonstrate that the uphill path which evolution must follow is open—otherwise there is *no* possibility of evolution occurring.

Find this process—win $5,000!

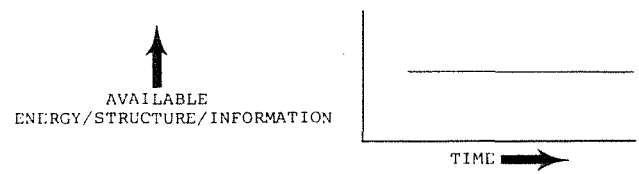
Submit your claim in writing to:

Bible-Science Association of Western Pennsylvania
Bairdford, PA 15006

Evolutionists! Defend your case scientifically! Break the thermodynamic barrier! Win $5,000!

R. G. Elmendorf
September 1, 1976

P.S. Oh, all right, let's compromise—$4,999 for a *horizontal* process on the same basis:



LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

An Evaluation of a Challenge that Isn't

Mr. Elmendorf's challenge is a fair illustration of the scientific level of typical creationist thinking. Before any readers go overboard planning what to do with the $5,000, let me make a few comments as one who has spent a year corresponding with Mr. Elmendorf in pursuit of his money.

To begin with, the challenge is *not* to evolution as accepted science. This is made evident by the italicized statement on the second page. Since evolution *does* require "prior and higher energy," Mr. Elmendorf is challenging a strawman of his own manufacture. On this point, I managed to extract a concession from him: "Oh, all right. We'll debate 'Evolution-From-There,' meaning you start with a limitless supply of matter and energy and evolve something having higher structure and intelligence." I didn't ask for a "limitless supply"; though, I can't guarantee that other challengers will be given even a limited one.

Also on the second page, we find the "Creative Trinity," which I deal with at some length in my article that appears elsewhere in this issue. The difficulty inherent in any attempt to convince Mr. Elmendorf that, on this matter at least, we should all be Unitarians ought to be apparent from the following quote from one of his letters: "The entropy defined in statistical mechanics is *not* the same thing as the entropy defined in classical (energy) thermodynamics, even though they are spelled the same. . . ."

Any attempt to beat this challenge constitutes a *Catch-22* situation, since Mr. Elmendorf is the sole judge. If he really knows what he is talking about, he will win the argument and keep the money. If he doesn't know what he is talking about, he will judge the outcome of any debate incorrectly and still keep the money.

Even so, the reader may wish to determine which of these two represents the actual state of affairs. If Mr. Elmendorf's statement concerning entropy was not sufficient to settle this matter, perhaps a few more quotes from his letters will be helpful: "Running water will not freeze" (On viewing a picture of a frozen waterwheel that I had sent him, he clarified this statement by saying, "It is true enough that running water *will* freeze, but it must first *stop* running in order to achieve the quiescent condition necessary for crystalization.") "On a comparative basis, it would seem that gases would have the most complex structure, liquids a less complex structure, and solids the least complex or 'simplest' structure." ". . . the *arbitrary* introduction of temperature into the classical definition of entropy . . ." (italics mine). "Although I have never looked into an atom, the Second Law would predict that it is 'running down.' . . ." ". . . the appeal of Prigogine with his 'dissipative structures' and so forth is the same as the appeal of relativity. Both represent a fundamental abandonment of reality, and both are

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

buried in a fog of mathematics. . . ." "You are no doubt aware that Relativity is in serious trouble in scientific circles." (Both quotes refer to special relativity.) "I accept the 'old' version of the Second Law, because I do not accept the indeterminite [*sic*] concept of statistical mechanics." "I view the Second Law simply as a statement of how the universe operates—in short, how it *is*. Statistical? Phooie!"

In case I have discouraged any reader from picking up the gauntlet on this one, Mr. Elmendorf has another challenge: *for $1,000*, prove that the earth moves! I don't know why the reward is smaller for a more difficult task.

—Stan Freske

Another Creationist Speaks

The most devastating and conclusive argument against evolution is the entropy principle. This principle—also known as the Second Law of Thermodynamics—implies that, in the present order of things, evolution in the "vertical" sense (that is, from one degree of order and complexity to a higher degree of order and complexity) is completely impossible.

The evolutionary model of origins and development requires some universal principle which *increases* order. . . . However, the only naturalistic scientific principle that is known to effect real changes in order is the Second law, which describes a situation of universally deteriorating order. . . .

The Second Law of Thermodynamics could well be stated as follows: "In any ordered system, open or closed, there exists a *tendency* for that system to decay to a state or disorder, which tendency can only be suspended or reversed by an external source or ordering energy directed by an informational program and transformed through an ingestion-storage-converter mechanism into the specific work required to build up the complex structure of the system."

If either the information program or the converter mechanism is not available to that "open" system, it will *not* increase in order, no matter how much external energy surrounds it. The system will proceed to decay. . . .

Whether rank-and-file evolutionists know it or not, this problem they have with entropy is thus *"one of the most fundamental unsolved problems in biology."* It is more than a problem in fact—it is a devastating denial of the evolution model itself. It will continue to be so until evolutionists can demonstrate that the vast imagined evolutionary continuum in space and time has both a program to guide it and an energy converter to empower it. . . .

—*Henry M. Morris*, "Entropy and Open Systems," *Acts & Facts,* October 1976, Impact No. 40

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Biological Evolution and the Second Law

William Thwaites and Frank Awbrey

Creationists make much of the second law of thermodynamics. They say it precludes the possibility of evolution because: "There is a general tendency of all observed systems to go from order to disorder, reflecting dissipation of energy available for future transformations—the law of increasing entropy" (Lindsay, 1968). The second law has been stated in many other ways, but we have picked this definition because it contains the all-important word *tendency* and because it is a definition often quoted by creationists. The word *tendency* is very critical, since it allows exceptions to the usual implication by creationists that *all* systems go to disorder. (One can get into many semantic arguments with words like *disordered.* Technically, an "ordered" state can be described with a *minimum* of statements or rules. Thus a page of nothing but A's would be more "ordered" than this page of text. We really should use a phrase like *high information content* in place of *ordered*, but let's stick with *ordered* because it's easier to say. Perhaps that's the reason creationists often say *ordered* when they really mean *high information content.*)

Consider how different the world would be if *all* systems became less energetic and less organized with time. There would be no puffy clouds, thunderstorms, or weather fronts. Their organization and energy would have dissipated long ago. There would be no trees or flowers. Their seeds would just decay. And we wouldn't be here either. Each of us would have died as a withering zygote that could not undergo development. Clearly the creationist implication that *all* systems tend toward decay and disorder is wrong. There are many systems besides evolution that tend toward greater order. Philip Morrison (1978), for example, has shown that spontaneous increases in order are common in our world. He points out that the second law really says that increases in order must be paid for in energy. Such increases are clearly not impossible except in closed systems lacking a source of energy. Where large amounts of energy are available, as in the sun-earth system, large increases in order are possible.

Creationists, of course, deny this while claiming that organisms contain

---

Drs. Thwaites and Awbrey have debated creationists from the Institute for Creation Research and the Creation Science Research Center on several occasions. They are professors of biology at San Diego State University.

(c) Copyright 1981 by William Thwaites and Frank Awbrey

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

some sort of God-given precoded plan and energy conversion system that allows them to escape the death and decay dictated by the second law. On the other hand, almost all scientists accept both the second law *and* evolution. We need to ask, therefore, just how the second law *does* affect living systems. A look at gene mutation should allow an answer to this question. A given normal gene will mutate to a nonfunctional version of itself with a characteristic frequency, often on the order of 1/1,000,000. (For every 999,999 times this gene is transmitted correctly to the next generation, it is transmitted incorrectly one time.) We could call this type of mutation from functional to nonfunctional a "damaging" mutation.

It comes as a surprise to some people, but nonfunctional genes occasionally mutate back to the functional version. We could call this a "repair" mutation. If genes were likened to cars, this would be like saying that occasionally a dented car could be correctly fixed by being in a second accident! However, genes are not cars; chemical complexity is not the same thing as physical complexity. Even though an explosion in a print shop will not produce a dictionary, energy can change simple methane and ammonia into complex amino acids, as Stanley Miller and Harold Urey demonstrated in 1953. Similarly, even though a second collision probably will not undent a dented car, a second mutational event occasionally renders a gene functional again.

The effect of the second law is clearly seen when the repair mutation rate is measured. This repair rate is *always less* than the damaging mutation rate. In other words, it is easier to go from an ordered state (functional) to a disordered state (nonfunctional) than it is to go in the reverse direction. A typical rate for this repair type of mutation is on the order of 1/1,000,000,000. This is the most important consequence of the second law on living systems. Clearly, the second law does not *prevent* systems from going from disorder to order. All the law does in this case is to make such mutations rare compared to mutations going in the thermodynamically favored direction—toward disorder. If that's all there were to it, however, gene systems would still eventually all move to a disordered nonfunctional state. They obviously don't. Is this because of a mystical precoded plan, or is there another, nonsupernatural explanation?

Now we come to the essence of evolution: natural selection. All that any organism has to do to escape "degeneration in accord with the second law of thermodynamics" is to be able to produce more young than are needed to replace the parents. As long as that is true, the occasional mutants (almost all less fit than the original version) will usually reproduce poorly or even die without adversely affecting the population. Since the harmful mutations are underrepresented in succeeding generations, these mutations simply cannot build up to a level that threatens the well-being of the population. Thus, mutations are random changes, usually toward disorder, but the effect of natural selection is to remove the relatively common disordered genes and prevent the genetic system from degenerating.

In the same way, natural selection can *replace* genes with the rare mutant

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

genes that represent an improvement over the original, thus serving as a type of ratchet to improve the organism and keep it matched to its changing environment. The entropy cost of the second law is paid as the energy required to produce those individuals that did not survive. The net result is that life opportunistically saves, builds upon, and improves whatever will function. At first glance, this may appear to conflict with the second law of thermodynamics, but the apparent conflict is not real. Therefore, no divinely precoded plan or mystical "vital force" is needed. Life and evolution are natural phenomena.

References

Lindsay, R. B. 1968. *American Scientist*. 56:100.

Morrison, P. 1978. in *On Aesthetics in Science*, ed. J. Weehsleo, p. 69. Cambridge: MIT Press.

Note

By analogy, we can apply the same sort of reasoning that creationists apply to the second law to another law of nature: Water tends to flow downhill. Imagine a possible creationist perversionof this law: Water *always* flows downhill; it can *never* flow uphill. How can we test this?

One day, some years ago, I happened to swim in a river just below a rapids. To my amazement, the current started carrying me upstream! Eventually, I was propelled into the mainstream and carried in the direction the water intended to go. But in short order I found myself being carried upstream again.

Could it have been that I was in the grips of some supernatural force that was capable of circumventing the laws of nature? How could water go uphill?

Most of us recognize that I was in an eddy current or whirlpool. The rapidly flowing water going downhill on one side keeps the whirlpool spinning like a giant top. Indeed, the water on the outside away from the mainstream is being pushed upstream by the water flowing downstream in the main channel. The natural law about water flowing downhill has not really been broken after all. Were the river to dry up, the eddy current would disappear also. It "lives" at the expense of the river flow.

So it is that the universe and even the solar system is running downhill toward greater disorder. But certainly there are eddy currents here and there. Life itself is one of those eddies. As vast amounts of energy are dissipated from the sun and even the core of the earth, life captures a tiny proportion and uses that energy to run "uphill" for awhile, against the second law of thermodynamics—or so it seems.

—William Thwaites

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Creationist Misunderstanding, Misrepresentation, and Misuse of the Second Law of Thermodynamics

Stanley Freske

One of the cornerstones in the crumbling foundation of creationist "science" is the notion that evolution contradicts the second law of thermodynamics. The classical version of this law may be stated as follows: *The entropy of an isolated system can never decrease.* (An isolated system is one that does not exchange energy or matter with its surroundings.) Creationists originally argued that a decrease in entropy is exactly what evolution requires, hence the conflict with the second law. This argument was used in an article by Dr. Morris of the Institute for Creation Research (ICR) as late as 1973. As is the usual practice among creationists, he tried to support it with out-of-context quotations from the writings of respected scientists.

Actually, it is not difficult to find inaccurate statements regarding entropy in popular science literature. Ever since the time it was first defined, entropy has been recognized as a most elusive quantity as far as understanding its physical significance is concerned. Defining it mathematically in terms of other quantities is no problem; however, this cannot be done to advantage in popular debates, a situation that creationists have been quick to capitalize on. Entropy has been defined nonmathematically as a measure of disorder, equilibrium, uncertainty, and unavailability of energy. Actually, to consider only the entropy content of a system is not enough; a system can gain entropy and, at the same time, become more organized, unbalanced, and richer in information and available energy. (A few examples will be considered later on.) What is important is the entropy *deficiency* of the system. We define this as the difference between the system's entropy *capacity* (the maximum amount of entropy the system is capable of holding with its present energy content) and the amount of entropy it is actually holding. This deficiency may also be referred to as *negentropy* (short for negative entropy)—a concept which, had it been generally adopted, might have been less confusing than entropy. Negentropy, then, has been defined as a measure of order, information, lack of equilibrium, and the availability of energy for doing work. But most fundamentally, negentropy—or entropy deficiency—is a measure

---

Stan Freske has a M.S. in physics from San Diego State (with additional graduate work in astronomy) and has many years experience in industrial research and development.

© Copyright 1981 by Stanley Freske

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

of the *improbability* of a system being in a given state. For this reason, when we discuss such things as the improbability of a certain nucleotide sequence, for example, we are also discussing entropy and the second law of thermodynamics.

A final warning: the word *order* in popular usage is highly ambiguous and should be scrupulously avoided in explanations of entropy for the benefit of anyone not already familiar with scientific jargon, lest it cause a great deal of confusion. (The mathematically inclined reader can refer to such works as Sears in 1959 and Brillouin in 1962 for more detail.)

Open Systems

The creationist argument given in the first paragraph contains a gaping flaw, and evolutionist debaters wasted no time in pointing it out: While the classical version of the second law does indeed state that the entropy of an isolated system cannot decrease, evolving systems are not isolated! One might expect that at this point the issue would be considered settled and everyone would pack up and go home. However, such an expectation would never be entertained by anyone familiar with the peculiar tenacity of creationists.

Let us see how Morris responds after he has been confronted with the clear evidence that evolving systems are open. In 1976, he said: "The second law really applies only to *open* systems, since there is no such thing as a truly isolated system." This statement suggests that he lacks the ability to distinguish between theoretical and practical concepts—an ability which is absolutely essential for the understanding of much of physics. It is certainly true that the second law applies to all thermodynamical systems; it wouldn't be much of a law otherwise. But the particular statement of the second law that Morris has in mind—namely, that the entropy cannot decrease—applies only to isolated systems. It is a purely theoretical statement, and in theory, any desired system can be postulated whether or not it can exist in practice. Let me mention another example: The concept of an ideal gas is utilized throughout thermodynamics and is extremely useful, even though no such substance actually exists. Just as real gases approximate an ideal gas, some better than others, there are real thermodynamical systems that are very nearly isolated. In these systems we do not expect the entropy to decrease. On the other hand, in a wide open system the entropy can either increase, decrease, or remain constant. The second law does not in any way prevent entropy decreases and the generation of entropy deficiencies in local systems so long as there is an equal or larger increase in entropy outside the system. This concept is easily grasped by most college and even high school students of science but not, apparently, by creationists, including those boasting Ph.D.s in the sciences.

It might now seem that all we have to do is give some examples of open systems in which the entropy decreases and *then* we can pack up and go home.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

But alas, no such luck. In an attempt to counter this, creationists have introduced a new device, which one creationist, Mr. Elmendorf, calls "The Creative Trinity," a properly descriptive phrase with an appropriate ring that I will therefore adopt.

The Creative Trinity

According to this creationist concept, a system can become entropy deficient only if three conditions are satisfied (Morris, 1976). (1) Free energy must be supplied to the system. This is actually incorrect, since a *loss* of energy can also generate an entropy deficiency; however, the need for the system to be open is universally recognized, so further discussion is unnecessary. (2) The system must contain an energy conversion mechanism. When creationists are pressed, we find that just about anything qualifies as having a "mechanism," including matter itself, so the statement becomes quite meaningless. (3) The system must contain a directing program. This is variously referred to as intelligence, information, control system, and so forth by creationists. The idea is that this directing program did not arise through natural processes but was created by God. The Creative Trinity can also be interpreted as a statement to the effect that there are different kinds of entropy which are not interchangeable.

We must take careful note of an elementary fact which is often missed in debates on evolution and the second law: In spite of what they claim, creationists are no longer talking about the second law. They wish to give the impression that science, in this case thermodynamics, is on their side in their opposition to evolution. But the fact is there is nothing in thermodynamics that contradicts the phenomenon of an entropy deficiency being produced in a system when energy flows through it. On the contrary, this is what thermodynamics leads us to expect, and nothing else is needed, such as a directing program, etc. It is interesting to note that, in his resolution of the long-standing paradox of Maxwell's demon, Brillouin showed that, to enable the demon to distinguish between fast and slow molecules, energy has to be supplied to the system, thus producing an entropy increase elsewhere in just the amount required by thermodynamics (Ehrenberg, 1967). And it doesn't matter whether the demon is an intelligent being or a simple mechanism.

Creationists are not showing that evolution contradicts the second law of thermodynamics; instead, they are saying that the second law, as accepted by conventional science, is incorrect and insufficient to explain natural phenomena. They insist that something else of their own making must be added—namely, a divinely created directing program or a distinction between different kinds of entropy. Let us now look at several examples to see how creationists attempt to support their claims and to show that their notions are wrong and unnecessary.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Crystal Growth

The example of crystal growth is particularly interesting, because it has been misunderstood and misused by evolutionist debaters as well as by creationists. While the g owing crystal is certainly an example of an open system in which entropy is decreasing, there is an important thermodynamical difference between it and a living system. In the crystal, the entropy is always at a maximum. In other words, while it is true that the entropy decreases as the liquid changes into a solid, this happens because the entropy *capacity* of the system decreases. The living system, on the other hand, contains an entropy *deficiency*, and this deficiency increases as the system grows or evolves. It should now be obvious that a debater who tries to draw too close a parallel between crystals and living systems will be in trouble.

Nevertheless, creationists have expended a great deal of effort attempting to explain the entropy decrease inherent in crystal growth. Elmendorf claims that there is no decrease in entropy, because liquids are more orderly than crystals (1978). When I pointed out to him in an exchange of letters that gases turn into liquids by a similar removal of heat, he decided that gases are the most orderly of all. I might have asked him why we observe changes of state in nature which proceed in the opposite direction by means of the simple addition of heat, such as snowflakes melting, however, I did not pursue the matter any further.

It is more interesting to examine the claim by both Elmendorf and Morris that crystals grow because of the divinely created directing program built into matter. Elmendorf simply tells us that "the molecules are pre-programmed," while Morris, with somewhat greater sophistication, explains that crystals are able to form only because of "the electrochemical properties of the molecules in the crystal" (1976). This quotation from Morris may sound perfectly reasonable (or should I say conventional?), but only because it is out of context. He subsequently informs us that these properties "could never arise by chance" or "within the constraints imposed by the second law," and finally concludes that they must be the work of "an omniscient programmer."

Two points should be noted here. First, Morris confuses the origin of matter and its properties with the process of evolution. This undoubtedly is done intentionally, since it is a common obscuring tactic among creationist debaters. Second, the divine programs built into matter are claimed to be capable of bringing about such entropy-reducing processes as crystal growth, development of a seed or egg into a mature organism, growth of populations, evolution of complex technologies, and so forth, but *not* capable of bringing about biological or even comparatively simple astronomical evolution. Creationists have nothing but contempt and ridicule for theistic evolutionists, an attitude made possible only by this severe inconsistency in their own belief system.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Convective Systems

In their attempts to prove their version of the second law, creationists often use the example of a pile of bricks lying in the sun. This is supposed to represent an open system that, although it is receiving an abundance of high-grade energy, is not exhibiting any reduction in entropy. Creationists gloatingly draw our attention to the fact that such bricks have never been observed to organize themselves spontaneously into a building. What they apparently fail to understand is that under the given conditions, an entropy deficiency is in fact generated in the pile. After several hours of exposure to the sun, the temperature will be higher at the top than at the bottom. If we were to measure the temperatures throughout the pile, it would be a fairly simple matter to calculate the entropy deficiency. Useful energy could actually be extracted from the pile by means of a thermocouple, for example. Creationists should tell us where in this mundane pile of bricks we find the divine directing program and conversion mechanism, supposedly necessary for an entropy deficiency to be generated in the system.

Incidentally, this pile of bricks, absorbing heat at the top only, is an example of a system that becomes entropy deficient even though the entropy in the pile actually *increases*. This seeming paradox results from the fact that, as heat is added, the entropy capacity of the pile increases faster than the amount of entropy contained in it. If we began again with a uniform temperature throughout the pile and then allowed heat to be removed from the top, as when cooling at night, the entropy would in fact decrease in addition to an entropy deficiency again being generated. We may also note that in this case the cause is a *loss* of energy. When discussing crystal growth, we saw that a loss of energy produced a decrease in entropy, but not a deficiency. Almost any combination is possible and we have to be extremely careful in making general statements concerning entropy.

Other, more impressive convective systems, in which large entropy deficiencies develop spontaneously as a result of the simple influx of solar energy, are meteorological systems such as hurricanes, tornados, and lightning storms. And consider the water cycle: Heat from the sun evaporates water from the ocean; the vapor is carried over the land by winds, which are also generated by solar heat, and is forced up by mountains, where it precipitates; the water eventually forms rivers with waterfalls and finally flows back into the ocean to close the cycle. The waterfalls, of course, constitute a well-known source of available energy. Where, creationists, are the directing programs in these highly organized, entropy deficient systems?

Mutations and the Genetic Code

The growth of a seed or egg into a mature organism constitutes an observable

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

process involving a large and spontaneous increase in the entropy deficiency of a localized system. Creationists naturally claim that the genetic code making this possible is just the directing program included in their Creative Trinity. It is certainly true that the genetic program determines just what the egg will grow into. But it is *not* true that this program is what enables the system to develop an entropy deficiency. In the course of a year, the earth receives 1.6×10^{21} watt-hours of energy from the sun and reradiates almost the same amount into space. But, because the incoming radiation originates on a high-temperature source (the sun) and the outgoing radiation on a low-temperature one (the earth), the whole process results in an outflow of entropy or inflow of negentropy. This negentropy flux can be calculated to be 3.2×10^{22} joule/°K per year (Tribus and McIrvine, 1971). A significant portion of this negentropy is used in biological processes directed by genetic programs, but a considerably larger portion is used to generate entropy deficient meteorological systems without the benefit of directing programs. Thus, the genetic program only insures that a small portion of the negentropy is used to develop a *particular type* of entropy deficient system. The only legitimate question left is whether the first bit of replicating genetic material could have come about naturally without violating the second law.

We may first note that all the information stored in a fertilized mammalian egg-cell is equivalent to only about 4×10^{-12} joule/°K of negentropy. Ordinary everyday processes that we observe all around us spontaneously develop entropy deficiencies that easily amount to billions of times this amount. Thus, it is not the generation of the entropy deficiency that consititutes the problem, although this is what creationists imply when they say that a natural origin of the genetic code would violate the second law.

Experiments of the type first performed by Stanley Miller have shown that the basic building blocks of life—amino acids and nucleotides—are generated spontaneously in a reducing atmosphere, consisting of compounds of carbon, hydrogen, oxygen, and nitrogen, when energy in the form of electrical discharges or high-energy radiation is supplied. We are unable to choose at this time the particular mechanism whereby these units assembled themselves into proteins and DNA (or RNA) respectively; there are several possibilities. A more important question is the probability of the spontaneous formation of such a chain with sufficient autocatalytic properties so that, once formed, it would promote its own duplication. Once this hurdle has been overcome, evolution can be expected to proceed through the combination of mutations and natural selection, as discussed later. For years creationists have been indulging in calculations intended to prove that the formation of the original functional chain is statistically impossible. Let us examine one such attempt by Dr. Gish, also of ICR (1978).

Gish begins by assuming that a functional chain would need to consist of 100 amino acids of the 20 different kinds found in living organisms. He then states that there are 10^{130} different varieties of such a sequence, which is correct. He

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

then assumes arbitrarily and, he thinks, generously that 10^{11} of these variations might be functional. Stated more directly, he has assumed, entirely without justification, that only 1 out of 10^{119} combinations is useful. But, to show what an extremely generous man he is, Gish then assumes that 10^{21} varieties are formed every second during a period of 5 billion years. He is still perfectly safe, of course; with his assumption of 1 in 10^{119}, the useful chain would never form. Gish doesn't mention whether anyone has systematically examined the properties of any significant number of such sequences. But even if thousands had been investigated, this would be nowhere near 10^{119}, and it would be just as reasonable to assume that 1 in a trillion (10^{12}), 1 in a billion (10^{9}), or even 1 in a million (10^{6}) has the desired characteristics. Actually, the evidence we have points in this direction. For example, examination of hemoglobins of different species shows that only 7 out of a total of 140 sites always have the same amino acid (Perutz, 1968). The probability of these 7 sites being correctly occupied, assuming again 20 different amino acids, is 1 in a little over a billion (1.3×10^{9}).

Now, if we go by what little evidence we have and make the far more reasonable assumption that 1 in 10^{9} is functional, and assume further that *only one* sequence forms each second (anywhere on earth), a functional one could be expected to form in about 32 years! On the time scales we are dealing with, even 32 million years is nothing, so we too can be generous and assume that only 1 out of 10^{15} randomly generated 100-member sequences is sufficiently autocatalytic. Let us see Gish or anyone else prove this impossible!

Perhaps the greatest unanswered question in biological evolution concerns the manner in which proteins and DNA (or RNA) became associated with each other. Creationists maintain that because we don't now know how this happened naturally, it could only have happened through divine design, and it is useless to investigate it further. We are fortunate that such attitudes have not prevailed universally at all times or science would never have evolved out of the Dark Ages.

We may speculate on whether evolution could at one time have proceeded through mutations and natural selection involving chains of amino acids only, but in the present discussion we will leave aside these early developments, of which enough is not yet known. Let us look, instead, at the evolution of the genetic program from that of primitive organisms even simpler than (and different from) modern viruses, to that of complex ones such as mammals. Although we recognize the enormous amount of variation possible in the normal genetic mixing associated with sexual reproduction, the only way in which something entirely new can be introduced is through mutations, including such phenomena as gene duplication. Creationists contend that, because of the second law, only detrimental mutations are possible. An examination of the mechanism involved will show that this contention is absurd.

Four nucleotides constitute the characters in the genetic code, and, for convenience, they are designated *A*, *C*, *G*, and *T* in the case of DNA. They are read in

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

groups of three called codons, each of which codes for an amino acid. A simple type of mutation is one in which one nucleotide is replaced by a different one, and, as a result, a different amino acid is coded for. (Because of a redundancy in the code, this does not always happen.) Since the genetic program has already been brought to near perfection through natural selection, a mutation is usually detrimental to the organism. It therefore tends to be weeded out of a population or, if it gives rise to a recessive gene, is limited in its spread. But there is, of course, no natural law which prevents an occasional mutation from benefiting the organism, especially if the latter exists in a changing environment. Such a mutation would tend to become more common and spread throughout the population. (An example is the acquisition of drug resistance on the part of asexually reproducing organisms, where variability due to genetic mixing does not play a part.) The important point here is that, as far as the second law is concerned, it makes no difference which nucleotide substitution occurs. *The entropy content of the genetic message does not depend on whether the substitution turns out to be beneficial or detrimental to the organism.*

We might profit from an examination of the fallacy that an accumulation of beneficial mutations would contradict the second law. It undoubtedly derives from the fact that, if such an accumulation were the result of a totally random process, it would indeed be contrary to the predictions of the second law. However, if each beneficial mutation is favored over an indifferent one, which in turn is favored over a detrimental one, then the process is by no means random, and we cannot invoke the second law to predict its outcome. The selective process just described is, of course, what we commonly refer to as natural selection.

In order for the complexity of the code to increase, a simple nucleotide substitution is not enough; instead, nucleotides need to be added to the existing sequence, perhaps through the process of gene duplication. Such an addition does constitute a minute negentropy increase, but, as we have seen, this does not at all violate the second law, since there will be a corresponding entropy increase elsewhere. In other respects, the addition is like the simple substitution discussed earlier; in particular, the entropy change in the genetic material is in no way dependent on whether the organism is helped or harmed, and the few beneficial mutations will be favored and accumulate, here adding complexity.

Summary

In their first and crudest attempt at creating the illusion of a contradiction between evolution and the second law of thermodynamics, creationists simply ignored the fact that evolving systems are not isolated. Their next endeavor consisted of altering the second law by maintaining that it precludes entropy decreases in all systems, not just isolated ones. Although they still occasionally

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

make either or both of these claims in debates, they apparently realized at some point, presumably after having been confronted with examples proving them wrong, that a new device was needed. So, they invented the "Creative Trinity." This actually *replaces* the second law, but they still refer to it as the second law of thermodynamics in order to maintain the air of scientific respectability.

There is a virtually unlimited number of examples of natural systems in which entropy deficiencies develop spontaneously, provided only that energy is allowed to flow across their boundaries, thus disproving the creationist requirement for a divine directing program or different kinds of entropy. We are awaiting coherent responses from creationists dealing with these examples.

This leaves only the task of examining the validity of the claim by creationists that genetic programs could not have developed naturally and must therefore have been intelligently created. A simple calculation of the probability of formation of a sufficiently autocatalytic chain of amino acids and an elementary examination of the process of evolution through mutations and natural selection from simple organisms to complex ones show that, whatever difficulties occur in the natural origin of life, they do not involve any violations of the second law of thermodynamics.

Bibliography

Brillouin, L. 1962. *Science and Information Theory*, Academic Press.

Ehrenberg, W. November 1967. *Scientific American*, p. 109.

Elmendorf, R. G. 1978. *How to Scientifically Trap, Test, and Falsify Evolution*. Bairdford: Association of Western Pennsylvania, p. 38.

Gish, Duane T. April 1978. "Impact Series, No. 58," *Acts & Facts*. San Diego: Institute for Creation Research.

Morris, Henry M. April 1973. "Impact Series, No. 3," *Acts & Facts*. San Diego: Institute for Creation Research.

———. October 1976. "Impact Series, No. 40," *Acts & Facts*. San Diego: Institute for Creation Research.

Perutz, M. F. and H. Lehmann. 1968. *Nature*. Vol. 219, p. 902.

Sears, F. W. 1959. *Thermodynamics, the Kinetic Theory of Gases, and Statistical Mechanics*. Addison-Wesley.

Tribus, Myron and Edward C. McIrvine. September 1971. *Scientific American*, p. 183.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Do Gaps in the Fossil Record Disprove Descent with Modification?

Niles Eldredge

Science seeks to characterize the nature of the universe, including the earth and all its attributes. It seeks to understand how the universe is constructed, how it came to be constructed in the way it is, and what those processes are that have produced the patterns we see in the natural world. Science does not work by simple pronouncements of *fiat*; rather, to qualify as science, an area of enquiry must attempt to explain natural phenomena in such a way that its statements can be tested by experiencing the natural world. More simply, we have to be able to go to nature to assess the veracity of the statements we make about it. If statements are not subject to such scrutiny, to verification by experience, they cannot be scientific. It is on these grounds that I characterize evolutionary biology as scientific and creationism, in whatever guise, as nonscientific.

Today we have only two remaining, but totally conflicting, bodies of statements that account for the diversity of life on earth. One is evolution. It says, basically, that all organisms are related by a process of ancestry and descent. It says that there is a particular nested set of resemblances we see in nature that unites all living things. For example: dogs, wolves, and coyotes, and other closely similar animals share certain resemblances not found in any other organism; we unite them accordingly into the family Canidae. We observe, in like fashion, that Canidae share certain similarities with Felidae (cats), Ursidae (bears), and several other families; accordingly we unite them into Order Carnivora. Carnivora share some attributes with other orders not shared with the rest of the known biotic world; hence we recognize Class Mammalia. And so forth. All of the biotic realm is structured this way. Ultimately, we predict that some attributes must be common to all life (RNA is an excellent example).

According to evolutionary biology, this pattern of nested resemblances is the straightforward, expected result of ancestry and descent: new characters arising from time to time are inherited by subsequent descendants. A hierarchical arrangement of similarities is the inevitable consequence. Since all organism are held to be related by this process, the major prediction of evolutionary theory is

---

Niles Eldredge is curator, Department of Invertebrates, at the American Museum of Natural History, is adjunct professor of biology at the City University of New York, and is adjunct associate professor of geology at Columbia University.

© Copyright 1981 by Niles Eldredge

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

that *there is one single nested pattern of resemblance linking all organisms in nature.* Now, the discipline of systematic biology, including paleontology, tests this proposition daily. Biologists, in analyzing their specimens, predict that newly studied characters will conform to the preexisting hypothesis of the nature of resemblances among them. If the general proposition that evolution has produced a single, nested pattern of resemblances among all elements of the biota is false, its fallacy would long ago have been exposed. If evolution were a false theory, there would be every basis for predicting that there would *not* be a single, nested pattern of resemblance among all organisms on earth.

Creationism says this apparent order in the biotic realm of nature did not arise by ancestry and descent among all organisms. Rather, in its purest form, creationism holds that each species is created separately by some supernatural creator. (Some creationists admit that some relationship on a small scale—say between different species of the genus *Canis* [wolf, coyote, dog]—may occur, but not between major "types" or "kinds"—meaning higher levels of the taxonomic hierarchy, between families, orders, classes, and so on. They admit the nested pattern exists at low levels, but deny that it does at higher levels, or at least claim that it does not signify relationship.)

The assertion of independent creation, in whatever specific guise, does not lead to a single generalization about organisms or any observationally testable predictions. In short, it is a simple, *fiat* assertion with no practical consequence allowing us to test it further in nature. It therefore cannot be construed as science.

These points are rather obvious. Creationists therefore spend most of their time attacking proponents of evolutionary theory. Their general line of reasoning is this: not all evolutionary biologists are agreed on either (a) the exact details of evolutionary history or (b) what precisely the mechanisms of evolution are. They present conflicting views and delight to find dissenters (like myself) who are known to be dissatisfied with one or another aspect of current evolutionary science. They try to use internal disagreement among evolutionary biologists as evidence that somehow evolutionary biology isn't science after all. In so doing, they again mistake the nature of science.

There is no field of science today whose adherents and practitioners are agreed on all points. Science cannot possibly work that way—it proceeds by evaluating conflicting views on the nature of the world by testing hypotheses (that is, by experience). To progress, science *needs* those conflicting views. A science is neither healthy, vigorous, nor even alive without such disagreement. Unanimity, in science, is generally a sign of stagnation. Biochemistry, nuclear physics, and all other major branches of science are the same way—rife with disagreement. In any typical science, at any point in time, some generalizations are fairly well agreed upon, while others are inevitably bones of active contention.

Creationists are fond of asserting that there are no intermediate forms between "major kinds" in the fossil record. To document their position, they con-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tact men such as Colin Patterson (British Museum) and myself, who have been among those paleontologists who have felt that paleontologists in general have tended to be a little overenthusiastic in dubbing particular fossils "ancestors." We have been concerned with the logic of verifying such statements. We urge caution. But we do not say that ancestors or transitional forms never existed or were never fossilized. From my own work I can cite the trilobit genera (from the Lower Devonian of Bolivia): *Kozlowskiaspis—Metacryphaeus—Malvinella—Vogesina*, which are connected by a compelling array of intermediates. Creationists can scoff at such series, familiar to all systematists and paleontologists, but the fact remains that such series exist and are consistent with the notion of evolution.

Moreover, the supposed lack of transitional forms trumpeted by creationists is analogous to the inability—of all of us—to see and therefore objectively to attest to the existence of atoms. Yet, I do not recall hearing anyone, creationist or not, seriously questioning atomic theory. This is because predictions arising from atomic theory can be tested and verified without anyone actually seeing individual atoms. The single nested set of resemblances uniting all organisms is the analogous prediction in evolutionary biology.

Finally, I will comment on patterns of occurrence of organisms in the fossil record. Standard evolutionary theory predicts gradual, progressive, incremental change leading from one species to the next. Most phyla (among those with readily fossilizable skeletal parts) originated in the Cambrian Period. Thus the fossil record is hard put to verifty this particular prediction of evolutionary theory. Aha! cry the creationists. Geologists and paleontologists have for years replied that the fossil record is too incomplete to retain the record needed to substantiate this particular prediction of evolutionary theory. Some of us now think that the predictions themselves are inaccurate, that the general notion of evolutionary ancestry and descent need not imply a gradual, progressive pattern of improvement and development of higher and higer forms. Aha! cry the creationists once more; biologists admit that the fossil record falsifies evolution! Not so, we reply: some details of evolutionary theory—notably that part which calls for slow, steady, gradual accumulation of change—is evidently in error, *not the general notion of evolution itself.*

In short, the notion that organisms are related by an evolutionary process of ancestry and descent is the only scientific theory which explains the hierarchy of resemblance among all living things. It is theoretically possible that it is wrong (else it could not be a scientific statement). It is, however, constantly being verified by scientists predicting distributions of characteristics, then checking their organisms, and verifying the predictions. Scientists disagree to some extent about how the process works and about what the more important evolutionary factors might be. This is normal science. Creationism does none of this. It gives us no testable, verifiable predictions about the nature of the organic world, and its objection to evolution as nonscience is not correct.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Moon and Spencer and the Small Universe

Robert Schadewald

One of the more damning realities faced by "scientific creationists" is the immense size of the universe. Creationists claim that the universe is at most ten thousand years old. Thus the supernova explosions regularly observed in the Andromeda galaxy, which is two million light-years away, cause them some embarrassment. Since they refuse to admit that the explosions observed in Andromeda today actually happened two million years ago, creationists typically present one of the folowing alternative explanations: (a) the universe was created with the light from distant objects already in transit (Freske, 1980: Philip Gosse's basic Omphalos argument); (b) the speed of light was infinite at creation, but became finite when Eve bit the apple (Harris, 1978: the Fall of Man); or (c) the large size of the universe is only an illusion.

The first two arguments are obviously as *ad hoc* as they are absurd. The third gives the same impression, but the creationists bolster it by citing a paper by Parry Moon and Domina Eberle Spencer, published in a legitimate scientific journal (1953). The latter paper is therefore of interest to those who oppose the creationists. Since we are dealing with appearances, before discussing the paper, I will *apparently* digress.

My interest in scientific creationism stems from my general interest in alternative science. My specialty is alternative geodesy, and, next to the flat-earth theory, I am most captivated by Koreshan Universology. Koresh (Cyrus Reed Teed) was, by his own admission, a reincarnation of Elijah, and he flourished in Chicago at the turn of the century. One of the tenets of Koreshanity was that the conventional globe is an accurate depiction of the earth, except for one thing: you have to turn it inside out. That is, the Indian Ocean is not straight *down* from the United States, but rather straight *up*. The entire universe is inside a Cosmic egg, with the surface of the earth being the inside of the shell, and the sun, moon, and stars being the yolk. The Koreshan universe is described in Koresh's *Cellular Cosmogony* (1898) and elsewhere (Gardner, 1957; Schadewald, 1980).

In August 1979, Martin Gardner told me that there is a formalism called

---

Bob Schadewald is a free-lance science writer, specializing in the off-beat. He has spent five years doing research on the history of the flat-earth movement and three years researching the creationists.

© Copyright 1981 by Robert J. Schadewald

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

"inversion geometry" by which one could turn the universe inside out and save the appearances. Thinking about this conversation a year later, I decided to invent my own mapping of the conventional universe into a Koreshan universe. All that's needed is a function whose limit approaches some constant as its argument approaches infinity. An obvious choice is the arctangent function, which returns a value less than $\pi/2$ for any positive real number. That is, for a suitable constant K, the equation

$$X' = K \arctan(X)$$

will map the entire universe into a hollow sphere. In particular, if X is measured vertically from the surface of the earth (in miles) and $K = 8000/\pi$, the equation will map the universe outside the earth into a Koreshan universe of radius 4000 miles. You simply transform the distances and reverse the directions of the position vectors. It is then possible to derive laws of refraction that account for appearances, including eclipses of the moon!

To return to what passes for reality, I first heard about the Moon and Spencer paper in January 1980. In a debate with Duane Gish at Lamoni, Iowa, John W. Patterson of Iowa State University brought up the problem of cosmic distances. In his reply, Gish said that it is possible that the universe is not as large as supposed. He noted that creationist Harold Slusher (who was present) and a graduate student at the University of Texas, El Paso, were pursuing the hypothesis proposed by Moon and Spencer, namely, that the universe is only 15.7 light-years in diameter. Patterson suggested that Gish might like to come to ISU and present this idea to the students and faculty there.

It was October 1980 before I got a copy of the Moon and Spencer paper. As discussed by Freske in the Fall 1980 issue of *Creation/Evolution*, it is actually an attempt to refute a pro-relativity argument based on the appearance of binary stars. By making a suitable (and totally ad hoc) adjustment to the distances of binary stars, the authors neutralize the offending evidence. It all seemed pretty absurd, but, when I reached the fifth page of the paper (p. 639), I nearly fell out of my chair. There was "my" arctangent function! The constant and units used by Moon and Spencer were different, but otherwise the distance transformation was exactly the same.

In light of this obvious versatility, I suggest that Mr. Slusher and other creationists interested in pursuing universes transformed by arctangent functions should investigate Koreshanity. They can even use their present equations if they reverse their vectors and suitably adjust their constants. The Biblical justification for this inside-out cosmos was not adequately worked out by Elijah, but it has since been presented in admirable detail by Fritz Braun (1972), to whose work they should refer.

But why settle for half measures? If one wants to play with ad hoc

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

mathematical transformations, it is easy to map the surface of our globe onto a plane. For instance, the azimuthal equidistant polar projection used on the United Nations Seal does it nicely. Indeed, this latter transformation, long used by the Flat Earth Society, is much more appropriate. And anyone who has read the Bible objectively from a literalist perspective can well conclude that it is, from Genesis to Revelations, a flat-earth book.

Bibliography

Braun, Fritz. 1972. *Space and the Universe According to the Scriptures*. Translated by J. H. Tonn. Bieselberg, Germany: Morgenland-Verlag.

Freske, Stanley. Fall 1980. "Evidence Supporting a Great Age for the Universe," *Creation/Evolution*. No. 2, pp. 36–37.

Gardner, Martin. 1957. *Fads and Fallacies in the Name of Science*. New York: Dover, pp. 22–27.

Gosse, Philip. 1857. *Omphalos*. London: J. Van Voorst.

Harris, David M. September 1978. "A Solution to Seeing Stars," *Creation Research Society Quarterly*. Vol. 15, pp. 112–115.

Moon, Parry and Domina Eberle Spencer. August 1953. "Binary Stars and the Velocity of Light," *Journal of the Optical Society of America*. 43:8:635–641.

Schadewald, Robert. December 1980. "Is the World in Curious Shape," *Isaac Asimov's Science Fiction Magazine*, pp. 9–106.

Teed, Cyrus Reed. 1898, *The Cellular Cosmogony*. Chicago: The Guiding Star Publishing Company.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Creationists Embarrassed in Oklahoma

Frank J. Sonleitner

This is an account of some of the events surrounding a recent creation-evolution bill that was introduced into the Oklahoma State Legislature and its defeat in the House Common Education Committee. The bill was essentially a product of the Institute for Creation Research in San Diego, California, a group that insists it does not engage in promoting creation legislation. Most of sections 4, 6, 8, 10, and 11 of the bill came from attorney Wendell R. Bird's model resolution, which was published in the May 1979 *Acts & Facts*, an ICR publicaton. Section 3, paragraphs 1 and 2, defining creation-science, were taken directly from Bird's model law, which is presently being pushed nationwide by Paul Ellwanger's Citizens for Fairness in Education, a South Carolina group. At the public hearing on the new legislation, I learned that Wendell Bird had, in fact, written this bill.

The bill was introduced into the State House of Representatives on January 22, 1981. By coincidence, on that same day, several of us from the University of Oklahoma at Norman (OU) met with the vice-chairman, several committee members, and some of the research staff to voice our objections to the bill. Four of us were involved: myself (a population ecologist), Professor Gerald Braver (geneticist), Associate Professor Gary Schnell (numerical taxonomist)—all from the Department of Zoology—and Professor John Wickham (geologist and chairman of the Department of Geology and Geophysics). I had previously prepared twelve pages of typewritten documentation covering: (1) a summary of the reasons for not teaching creationism in the public schools, (2) the scientific method, (3) an outline of the logical structure of the theory of evolution, (4) the scope of creation science, (5) the biblical nature of the creation model, and (6) several highly detailed and documented examples of the incorrect and distorted material that the creationists use as "scientific evidence." Four copies of this report were given to the committee at this meeting. (I had received my first issues of *Creation/Evolution* the day before. I later sent the committee copies of the Edwords article from Issue I and the Weinberg and Kraus articles from Issue II.)

In the period that followed, the news media—especially radio and television—presented, almost exclusively, the creationist side. Moral Majority politicians

Frank Sonleitner is an associate professor of zoology at the University of Oklahoma at Norman.

© Copyright 1981 by Frank J. Sonleitner

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

made scientific pronouncements on radio talk shows and television news spots, and Ed Blick and John Morris of ICR made at least one televison news interview each. Nonetheless, one television news team was interested in interviewing our group, but it was nearly two weeks and many phone calls before they finally came. The interview was held off campus at the Lutheran Student Center. In addition to the original four scientists, three ministers joined us to oppose the bill: Don Gibson (United Campus Christian Fellowship), David Klumpp (University Lutheran Chapel and Student Center), and Hugh Jeffers (a Presbyterian minister, lecturer, and administrative assistant in the College of Education). About five minutes of tape were made containing statements by four of us. Only about thirty seconds was actually aired on the five o'clock news, Monday, February 2, 1981, and that was followed immediately by an interview with "another OU professor," John Morris! At the Education Committee public hearing, the chairman of the committee, Jim Fried, chided the news media for misleading the public into believing that the bill would provide for the teaching of biblical creation in the schools when, in fact, it specifically prohibited that.

A subcommitte held a meeting on the bill on Tuesday, February, 3, and the full committee held the public hearing on Wednesday, February 4. Immediately following the public hearing, they debated on the bill for nearly two hours, after which they voted twenty to four to "report progress," which, for all practical purposes, amounted to killing the bill in committee.

The hearing was held in a small conference room at the State Capitol in Oklahoma City that barely held the twenty-six members, the people wishing to testify, and the crews of the three commercial television channels and the PBS channel. Although twenty or more people had put their names on the agenda to speak, including two professional atheists, the committee chairman (who was determined to squash the bill) only allowed about ten people to speak.

The main testimony in favor of the bill was given by the ICR pros: Ed Blick (OU professor of engineering), John Morris (OU assistant professor of geological engineering), and Wendell Bird (ICR lawyer). They presented the usual ICR propaganda. In addition, an Oklahoma biology teacher, who looked more like a football coach, claimed that evolution was given undue emphasis in his school, and a Tulsa theologian, who was ostensibly testifying in favor of the bill, in fact gave a long series of theological and religious objections to it!

The seven people previously mentioned in our group, along with two others, Professor John Renner (well-known researcher on science education in the OU School of Education) and zoology Professor Emeritus Paul David, came to the hearing prepared to give oral presentations. Only three—Wickham, David, and myself—were actually called upon to speak at the hearing. We each had three minutes. Wickham said that the bill would have an adverse effect on science education and that it represented a restricted view of creation; David pointed out that the bill was probably unconstitutional because it gave preferential treatment to

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

fundamentalist Christian beliefs; while I attacked Section 4, paragraph 1, of the bill, which claimed that the study of origins was not science because no one was present to observe when life first appeared. A Tulsa school teacher also testified against the bill.

Up to this point, the public hearing was "*dull* as dishwater." Then, the "organized (Democratic) committee opposition" to the bill called on their "star witness," Leroy Taylor, superintendent of Liberty School in Sequoyah County on the Arkansas border, who gave a theatrical performance in the role of the "good-ol'-down-home-country-boy school teacher." He cracked jokes, poked fun at the legislature, and asked them to "leave us alone—we know what we're doing. We're not teaching evolution—we're teaching biblical creation." Needless to say, he was featured in all the television coverage of the hearing.

Taylor set the stage for the committee debate on the bill. The chairman decided not to consider any of the proposed amendments such as requiring teaching of *biblical* creation, the resurrection of Jesus, Hindu science (modified), flat-earth science, and so forth, and proceeded directly to debate on the bill. Only three committee members, including the main author of the bill, wanted to speak in favor of it, while many more, including the chairman and vice-chairman of the committee, wished to speak against it. And the opposition "hoisted the creationists by their own petard"; they out-Baptisted the Baptists! To summarize, they claimed the following:

1. This bill was an example of big government telling the local school boards what to do. And it was coming from a party that had just won a big election on a promise to do away with big government. If any parents had any complaints, they should go to their local school board.

2. This bill actually outlawed teaching biblical creation, because it required that, if creation was going to be taught, it must be taught as a *mere* scientific *theory* (in the perjorative sense of the word), which requires evidence and verification. Representative Gray (Democrat) quoted from the Bliss book, *Origins, Two Models: Evolution Creation*, page v, where the author says that his book will develop "your ability to think *logically*, to *search for data and its meaning*, and to *demand verification*." He then imagined how, on a Sunday afternoon, while the family was sitting on the back porch and the father or minister was telling the story of Jonah and the Whale or the resurrection of Jesus, the children would *demand verification*, as they were taught to do in school. He then rejected the idea of teaching creation as a science. *Biblical* creation should be taught as a *fact* that was to be accepted on *faith*.

3. In most cases in Oklahoma where only one theory of origins was being taught, it was *creation*, not evolution, that was presented. Therefore, this was an evolution bill that would require all those schools to teach evolution. (The legislative authors of the bill apparently swallowed hook-line-and-sinker the ICR propaganda that evolution pervades all the public schools. They had no evidence

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

to back up this view except that very few of the current biology textbooks mentioned creation.)

Overlooking the strong likelihood that much of this was a carefully contrived and rehearsed ploy to defeat the bill, the above three points are true. And people working against equal-time-for-creation-science bills might find them useful arguments in staunchly fundamentalist states. (A scientist could bolster such arguments by pointing out that, if creation was going to be taught as a science, it would have to obey all the rules of scientific inquiry. All miracles would have to go. Everything would have to be explained in terms of detailed naturalistic mechanisms that could be tested and falsified. And, if this were done by using the two-models approach in an unbiased, accurate, and rationally consistent manner, the outcome would be the same as it was historically: the creation model would be falsified.)

Imagine those orators, all claiming to be upstanding, fundamentalist Christians and trying to out do William Jennings Bryan at the Scopes trial! The PBS television channel broadcast most of this debate the following Sunday night on its program, "Legislative Week in Review." But they left out one of the most entertaining parts. Representative Duckett (Democrat) was pleading for the bill, and he told a story that went something like this: "I visited the zoo last weekend, and while I was walking through the Primate House I heard a voice say, 'Please pass the bill.' I was surprised when I looked around, because there wasn't anyone there. Then I realized that one of the monkeys in a cage was talking to me. 'Why do you want that bill passed?' I asked him. 'We don't want your children to be taught that they are descended from us. After all, we don't fight wars, drop atom bombs, and pollute the environment! Please pass the bill.' " When Duckett was finished, he yielded to Representative Cox (Democrat) for a question. Cox, a black man from Oklahoma City who previously had spoken against the bill by waving his Bible and telling how he learned his religion at his mother's knee, held out his Bible to Duckett and asked, "Will you put your hand on this book and swear that that monkey spoke to you?" It brought down the house. (Several of us were reminded of Oral Roberts who recently claimed to have had a vision of a nine-hundred-foot-tall Jesus who had spoken to him.)

To be fair, it must be mentioned that other arguments against the bill were voiced: (1) that it would give legitimacy to a pseudoscience that couldn't get respectability on its own in the scientific community, and (2) that the astrologers and flat-earthers would soon be demanding similar laws.

I was pleased at the outcome of the meeting, especially because the "scientific" creationists were rejected on religious grounds. I'm sure they had imagined that Oklahoma, with its fundamentalist Christian population and Moral Majority politicians, would be a shoo-in to pass this legislation. The people from OU were delighted to see Ed Blick sneak out of the meeting early. Morris and Bird were sitting too far in front to escape; they had to stay there to the bitter end, looking

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

quite uncomfortable and dismayed. Even the authors of the bill were apologizing for it and admitting that it needed a great deal of revision. And one freshman representative asked that his coauthorship of the bill be withdrawn!

From the Editor:

New Creationist Bills, Resolutions, and Court Cases Appear Nationwide

In the last issue, we provided a chart of states where creationist action had taken place. Recent events, particularly in the first quarter of 1981, have rendered that chart obsolete. Creationism is breaking out from coast to coast. States we've heard about are Alabama, Arkansas, California, Colorado, Florida, Georgia, Indiana, Louisiana, Minnesota, Mississippi, Missouri, Ohio, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Washington, and Wisconsin. What follows are the details we have. Please understand, however, that events often move faster than our publishing schedule, and we sometimes depend on individual subscribers to report to us about actions taking place in their areas.

Arkansas

While all eyes were on California, while school was out, and on the last day of the legislative session, a creation bill was passed in Arkansas without resistance. This bill, along with a heap of other pieces of midnight legislation, went to the governor (who was elected on a Moral Majority platform) for signature. The creation bill was the first he signed, and he did so without even reading it. So now it is the law in Arkansas that, whenever evolution is taught, creationism must be given equal time. The ACLU plans litigation, and many scientists in the state are gearing up for a court battle. Arkansas is a state that does not have a Committee of Correspondence to fight such creationist efforts.

California

In *Segraves* v. *California*, a nonjury trial, began March 2, 1981, in Sacramento County Superior Court. The plaintiff was Kelly Segraves, administrator of the

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Creation-Science Research Center of San Diego, who was suing on behalf of his children. He was represented by Richard Turner. The defendants were the State Board of Education and the Department of Education, represented by Deputy Attorney General Robert Tyler. The case began early this past year, when a Superior Court judge rejected a petition filed by the Creation-Science Research Center for a temporary restraining order against the use of textbooks that treat evolution as fact. CSRC appealed the dismissal, then dropped it to pursue, instead, a permanent injunction and a chance to take the case to trial on the grounds that the state was violating constitutional law by teaching evolution exclusively. However, after having spent $50,000 in legal costs, CSRC attempted to settle out of court with a compromise. They offered to drop their suit if the state would require teaching evolution as one of a number of theories and stop treating as fact the view that humans developed from earlier forms. This proposed settlement was rejected on February 5, and so the suit went to trial. At the conclusion of the case on March 6, the judge ruled that the state guidelines on the exclusive teaching of evolution do not present it in a dogmatic way and so do not represent a burden on the religious free exercise rights of creationists. However, the judge ordered that the state Board of Education's 1973 policy on avoiding dogmatism in the teaching of origins be sent to all school districts and science teachers in the state, to textbook publishers, and for inclusion in future editions of the guidelines. CSRC is the legal arm of the twenty-thousand-member Bible Science Association, an international organization with local chapters in many communities.

In Livermore, California, a group of parents, most of whom were scientists, challenged an elementary school creation-evolution science class. They declared that Ray Baird, a member of a Christian teachers group, was teaching fifth- and sixth-grade students with inappropriate religious materials. These materials were purchased with school district funds from Creation-Life Publishers, the publishing arm of the Institute for Creation Research. They included books, filmstrips, and audio-visual aids that, in some ways, ridiculed evolution and linked it with Marxism and Nazism. Some of these materials asserted that evolution was the cause of racism and military aggression. Ray Baird admitted that he should have reviewed the materials better before using them and that he had made a mistake—they were not appropriate. The district subsequently reviewed these same materials and stated that they were all "considered to be biased, misleading, inaccurate, prejudicial, and derogatory" and frequently asked students to make a choice between believing in God and believing in evolution. Then, on February 3, 1981, the Livermore school board voted unanimously to stop the teaching of the Bible-based theory of "scientific creationism." The board also ruled that, if it eventually permits the subject to be taught, the teachers must be skilled in the subject and that there should be "an appropriate instructional support system." Furthermore, "instruction about creation beliefs shall be limited to social studies or literature." Ray Baird had taught the class for three years without incident,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

but this was the first year he had used the Creation-Life materials.

Florida

This past December, the Hillsborough County School Board voted 4–3 in favor of giving creationism equal time in the county schools. The decision followed several public meetings on the issue in which testimony was heard from both sides. Dr. Gish from the Institute for Creation Research was on hand and spoke persuasively at one meeting, and Richard Bliss, also from ICR, came to town for a newspaper interview during the period of decision. Once the decision was made, the board set up a committee of teachers, citizens, and professionals and ordered this committee to accept materials on how to introduce a "multi-model" approach to origins into the curriculum by the fall of 1981. The board's intent seems to be to have "scientific creationism" taught not only in secondary school science classes but wherever the subject of origins arises and at whatever grade level. The professional staff of the appointed committee has been ordered to write instructional material on origins so as to avoid use of creation texts developed by groups like ICR. The staff is on record as opposing this "multi-model" instruction, but their jobs depend on them following through with the ruling. Their approach, however, is to present the different models with fairness and according to the facts of science and the methods of logic and scientific inquiry.

As a result of this decision, several other counties in Florida are under fire, particularly in the Tampa-St. Petersburg area. John V. Betz at the University of South Florida in Tampa was appointed to the Hillsborough board's committee. He regretfully feels that the tide is turning in Florida toward introduction of creationism in Florida's public schools, even though a legislative bill is not in the offing.

Georgia

As promised, creationists tried again in Georgia after this past year's near-passage of a creation bill by both houses of the state legislature. Representative Tommy Smith of Alma introduced a revised version of the 1980 bill. This version prohibited religious instruction, declaring that teaching "shall be limited to scientific evidence for each model and must not include any religious instruction or reference to religious writings." It was read on the floor and then referred to the House Education Committee. However, it died there when Smith decided to withdraw it and save the battle for next year. The reasons for the withdrawal have been hard to determine.

Spike Brooks, chairman of the 130-member Georgia Citizens' Educational

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Coalition, said his organization printed brochures to persuade the legislators to oppose the creation measure. The brochures quoted two Georgia pastors and a church report, which claimed that evolution is noncontradictory with the Bible and that many Christians are "theistic evolutionists." Brooks has been in the center of this battle both this year and last, and his organization is an effective foil to creationist efforts. Membership in the Coalition is five dollars. If you wish to join, write to Mr. Brooks at Seven Vista Square, NW, Atlanta, GA 30327, or phone (404) 355-9724.

Louisiana

State Senator Bill Keith tried to push creationism in Louisiana, but apparently to no avail. A subcommittee of the Joint Legislative Committee on Education met to hear pro-creationist testimony from Edward Boudreaux, a University of New Orleans chemistry professor, and two other scientists from the Louisiana State University system. The proposal was for two-model legislation. However, the subcommittee never gathered enough members for a quorum, and legislators walked in and out during the two hours of testimony, sometimes leaving only one legislator in the room. Senator Keith had a similar problem when he introduced a creationism bill in the 1980 session of the legislature. Members of the Senate Education Committee slipped out of a committee meeting, thus avoiding a vote on the issue. Keith, however, has tried to argue that the subject is politically safe, citing a north Louisiana newspaper poll that showed that 75 percent of parents polled were in favor of creationism being taught in public schools. If such legislation is ever passed in the state, there is a good chance that Governor Treen will sign it into law.

Ohio

> Teachers in all fields are encouraged, when considering or teaching the origin of life or the universe, to present all major theories, including those of creation and evolution. These should be stressed as theories, rather than established fact, and accorded proper treatment in time, emphasis, and attitude to protect the rights of all students. An adequate amount of reference material shall be provided by the Columbus Public School Libraries to lend support to each theory. Teachers should supplement Board of Education adopted texts with materials which attempt to provide unbiased information about the various theories of the origin of life and the universe."

The above is an exact quote from the agenda of the Columbus, Ohio, Board of Education meeting of November 18, 1980. The Board heard only three statements

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

from the public on this creation policy, and all were critical of it. The Board then went on to discuss other policies. Once discussion was completed, the vote was taken on all policies under consideration—as one group. The vote was unanimous, seven to zero, to adopt everything, including the policy on origin theory. This policy was first adopted in March 1971 by the unanimous vote of the Board. It was Section 910 of the *Administrative Guide*, and was entitled "Etiological Theory." The November 1980 vote, then, merely changed it to a "Board Policy on Origin Theory," maintaining the exact original wording. Board member Paul Langdon, who has been on the board for over twenty years, originally worked to get the policy adopted. Biology teachers have, in the past, received ICR creationist books as gifts from Mr. Langdon to use as supplimentary teaching material. The Board has not, however, ordered the use of public funds for any creationist textbook purchases.

Oregon and Washington

There is a model creation law floating around this year, the lion's share of which was drafted by Wendell Bird and which is being pushed by Paul Ellwanger's Citizens for Fairness in Education, a South Carolina group. It has already popped up in Washington and Oregon, and was the bill that passed in Arkansas.

The Washington version is House Bill 234. The American Civil Liberties Union geared up for a battle in that state, because the recent conversion of a Senate Democrat to Republicanism suddenly gave both houses of the Washington legislature a Republican majority. Last heard, the bill was still in the Education Committee, but appears doomed to failure as a result of a public hearing.

The Oregon version of the bill is in the Legislative Assembly as House Bill 2633. Though its provisions are rearranged in a slightly different order, careful comparison reveals it as essentially the same model bill, requiring "balanced treatment" in public school science of both creation and evolution. Oregon Attorney General James Brown said that such a requirement is unconstitutional. Furthermore, in December 1980, Brown issued a twenty-page opinion on the matter, which stated that Oregon public schools are not required to teach creation just because they teach evolution. But the same report also said that the teaching of scientific creationism is allowable unless it constitutes religious instruction and that local school boards have the right to decide what constitutes religious instruction.

Whether or not this opinion set off the move to push creationist legislation this year, it certainly did set off a flurry of local school board activity in the state. For example, the school board of Grants Pass voted three to two against passage of a proposed creationist resolution promoted in their district. Nine residents of the district testified against the idea of equal time for creationism, and no one tes-

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

tified for it. The Board's ruling declared that the district's existing policy on teaching controversial issues such as origins is sufficient. Said policy requires instructors teaching about the origins of life to acquaint students with various points of view. The regulation says: "The teacher is not to identify any one theory of origin as *the* way. . . ."

But if Grants Pass got by, the Phoenix-Talent School Board didn't. There were a number of rounds of discussion on the matter, followed by a ruling on January 22, 1981. That ruling resulted in a policy that allows creationism into the science curriculum without actually referring to creationism by name. What the policy says, in four points, is this:

1. Teachers will become knowledgeable concerning major theories (and the evidence upon which they are based) in their area of instruction, particularly those espoused by their students.

2. Teachers will, when instructing students, carefully distinguish evidence, data, and facts from theory, hypothesis, and conjecture.

3. Teachers and others responsible for curriculum content will seek to be unbiased and nonderogatory regarding differing theories in the development of curriculum, class presentations, their choice of reference material, allotments of class time, and evaluations of evidence.

4. Teachers' academic freedom will be preserved in accordance with their negotiated contract in their right to express their personal evaluations of the theories presented, provided they clearly designate these as their own opinions.

The Board approved this policy unanimously after rejecting a much more strict creationist resolution. The new policy has partisans of both sides confused. The creationists want creationism mentioned by name. The local ACLU has stated that if this results in an infringement on anyone's rights, it is willing to take the case all the way to the Oregon Supreme Court.

South Dakota

In the case of *Lloyd Dale* v. *Board of Education, Lemmon Independent School District*, the court upheld the firing of Lloyd Dale for giving too much time to creation-evolution in his high school biology class. In spite of the fact that ICR claims this is an example of the "Scopes trial in reverse," the court found Dale was devoting so much class time to the controversy that students began complaining that they were not being taught basic biology. From testimony, it became evident that Dale's desire to devote 30 percent of the course time to creationism resulted in him not covering the required subjects in the text. In fact, so much had been left uncovered in the first three quarters of the school year that it couldn't be made up in the remaining quarter. Eleven of his twenty-five students transferred out of his class. The board never forbade Dale from discussing creationism, but

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

only asked him to not teach it so much that it interfered with the basic material of the course. Dale repeatedly refused to cooperate and so was fired.

Washington, D.C.

In the case of *Crowley* v. *Smithsonian Institution*, the U.S. Court of Appeals ruled against the creationists on October 30, 1980. The case had begun back in 1978 when creationists sued the Smithsonian Institution in the U.S. District Court of Washington, D.C. The suit charged that the Smithsonian was teaching the religion of "secular humanism" by having an evolution display at taxpayers expense, and that said display inhibited the free exercise of religion of certain Christian fundamentalists. The creationists sought an injunction prohibiting the exhibit, "The Emergence of Man," and other similar exhibits, or, as an alternative, asked for an order requiring the museum to commit equal funds to explain creation along the lines of the biblical account in Genesis. The U.S. District Court refused to accept the creationist description of evolution "as, and only as, part of the religion of secular humanism" and did not regard the museum exhibit as expressing hostility to religous theories of creation. The Court further stated that the creationists' free exercise of religion was "not actionably impaired merely because, should they visit the Smithsonian, they may be confronted with exhibits which are distasteful to their religion." Therefore, the court ruled against the creationists. This defeat led the creationists to appeal, but the appeals court, on October 30, 1980, upheld the original decision, further adding that the creationists' appeal was "essentially a challenge to the concept of evolution," and as such was immaterial to the case. The fact that the creationists were able to name one religious group which espoused evolution as a tenet was also regarded as immaterial.

Wisconsin

While in the early stages of constructing a new earth sciences exhibit on origins, the Milwaukee Public Museum was brought under attack in February by the Creation-Science Society of Milwaukee. They wanted the new exhibit to consider their view as well. Robert West, curator of geology at the museum and a subscriber to *Creation/Evolution*, decided to bring up the possibility of needing to give equal time for flat earth science if creationism was going to be presented. This effort, fueled by helpful information from Bob Schadewald, gained some notoreity in the local press. In a showdown five creationists met with an equal number of scientists from the museum. However, Walter Brown, director of ICR's midwest center in Illinois, presented the main case. Among the pieces of literature he

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

passed out was an item called "The Scientific Case for Creation—103 Categories of Evidence—The Theory of Evolution is Invalid." This involved eleven pages of text and four pages of references. Nonetheless, the creationists failed to convince the museum board to change the planned exhibit. As West quipped about the creationists' appeal to the public's supposed desire for creationism, "Why not fire all the scientists then and have an annual newspaper poll as to what exhibits to place in the museum?" The Smithsonian Institution verdict played a helpful role in this Wisconsin battle.

Related Events

In December 1980, the American Anthropological Association passed overwhelmingly a resolution declaring evolution to be "the best scientific explanation of human and nonhuman biology and the key to understanding the origin and development of life," and stating that efforts to require equal-time teaching of creationism with evolution "are not based on science but rather are attempts to promote unscientific viewpoints in the name of science. . . ."

In Toronto, Canada, at the 1981 annual meeting of the American Association for the Advancement of Science, four scientists—physicist Rolf M. Sinclair of the National Science Foundation; William G. Mayer, director of the Biological Sciences Curriculum Study in Boulder, Colorado; Milton K. Munitz of the City University of New York; and Smithsonian Institution scientist Porter M. Kier—all spoke on the issue of the creation-evolution controversy. Shock was expressed at what the creationists are doing in the schools and the nature of their arguments and tactics. The scientists shouldered much of the blame for the situation themselves. "There has been a real failure in science education and communication of science to the public," said Dr. Sinclair. When a report of this meeting appeared in the January 10, 1981, *Science News*, however, the reaction was divided. Letters appearing in the January 31 issue took different sides as to which was true —creation or evolution—and took different positions on whether the attack on creationism was justified.

Ever since the project began in the last months of 1980, Committees of Correspondence in defense of evolution have been organized in twenty-five states. The organization of committees in additional states are also under way. Persons interested in helping the defense of scientific rationalism and secular education can join a committee or can help organize one in a state where none yet exists. Information is available from Stan Weinberg in care of this journal.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Creationism and Evolution: Organizing a Symposium

David Kraus and Jerry Resnick

How can you organize an all-day symposium on creationism and evolution? The Science Council of New York City (SCONYC), composed of nine science teacher organizations, sponsored such a conference at Rockefeller University on Saturday, December 6,.1980. From conception to fruition, it took five months. The following article was prepared so that others may benefit from the experiences of those who were neophytes in such an undertaking.

SCONYC's symposium on "Creationism and Evolution" grew out of the pedagogue's proverbial "response to a felt need." We found that many of our colleagues were vague about answering creationist allegations because (1) they were unaware of recent developments in evolution theory and the implicatons of these developments for the controversy, and (2) they had no overall view of the arguments on each side. In addition, many were oblivious to the extent of creationist penetration into local school boards, textbook adoption committees, and state legislatures.

Planning

At its first meeting in July 1980, the symposium committee (composed of representatives from the various organizations) considered the objectives for the proposed conference. More pedagese? Not really. Clearly stated objectives not only determine the program but also affect such routine matters as the admission fee (if any), the data to be requested at registration, and the composition of a questionnaire for the audience. After much airing of views, the committee decided to

---

David Kraus is chairman of SCONYC's Committee for Scientific Freedom. He was formerly president of the Biology Chairmen's Association of New York City and served until his retirement as chairman of the Science Department at Far Rockaway High School. His address is: 261 Beach 138th Street, Belle Harbor, NY 11694.

Jerry Resnick is president of SCONYC and vice-president of the National Association of Biology Teachers. He is assistant principal (supervision) at Sheepshead Bay High School, 3000 Avenue X, Brooklyn, NY 11235.

© Copyright 1981 by David Kraus and Jerry Resnick

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

expand its objectives to include *action* as well as *education*. The thrust of the symposium, thus, would be both to educate our colleagues and to make a start at organizing science teachers and scientists for thwarting the creationist initiative.

At this first meeting, committee members agreed to spend the next month exploring such matters as potential speakers, time schedule for the symposium, possible sites, identifying individuals who could be called upon for assistance with specific tasks, methods of publicity, and problems of financing. During this time, we, Kraus and Resnick, as co-chairpersons, met weekly to coordinate and evaluate the ideas that were being forwarded.

When ready to present its tentative plan, the symposium committee met with the executive board of SCONYC to obtain approval. At this meeting, people volunteered for such assignments as program, publicity, finance, printing, registration, and mailing. We set D-day for Saturday, December 6, 1980—subject to availability of the proposed panel of speakers and of the host institution. We brainstormed about possible speakers and sites.

In setting the date, we considered such factors as national holidays, religious holy days, school examination schedules, national examination schedules (SATs), and even preholiday shopping periods. We agreed that our proposed program would be too lengthy for an evening meeting and that an all-day symposium would be needed instead. But when we opted for a Saturday conference, we (alas!) introduced the complication of finding food and dining space for almost four hundred individuals on a weekend.

Preparation

Then, a host of interrelated tasks had to be accomplished almost simultaneously. The cochairperson established a list of priorities, assigned responsibilities to specific individuals (including themselves), and monitored progress.

These are some of the tasks that had to be done:

1. *Establish the program.* To address the symposium, we invited individuals known to be outstanding in specific areas of evolution theory, who are knowledgeable about the creation-evolution controversy, and who have been involved in nationwide efforts to organize evolutionists on the grass-roots level. We aimed high and did not hesitate to pursue the most wild-eyed suggestions that had emanated from our committee meetings. The speakers invited were Isaac Asimov, Niles Eldredge, Wayne Moyer, and Stanley L. Weinberg. *In no instance did we have a refusal.* It was all done by telephone, followed by a letter of formal invitation. We did not find it necessary to approach our alternate choices.

2. *Select the meeting place.* We considered such factors as the prestige of the site, centrality of location, seating capacity, cost, public transportation, and parking. A phone call "cold" (that is, without benefit of advance introduction by

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

a prestigious scientist) to an officer at Rockefeller University was met with a cordial expression of interest. This was followed by letters, personal visits, and the completion of an application form. Through the efforts of a gracious secretary who served as contact person, we made arrangements for a projectionist who would also tape the proceedings, for use of extra rooms, for platform seating and microphones, for registration tables at the entrance, and even for the use of the restricted parking area for the speakers and key individuals. Finally, we obtained definite approval before printing our announcement fliers.

3. *Registration.* We decided upon advanced registration by mail at a $2 fee. We reasoned that a person holding a paid-for ticket would be more likely to attend than one who must make a crucial decision on a possibly snowy December morning. In establishing the nominal fee, we were more concerned about attendance than defraying costs. We established November 28 as the deadline for advanced registration, but indicated that on-site registration would cost $3, if eats were available. Rose Blaustein handled registration matters; John Augenstein prepared questionnaires.

4. *Print announcement fliers.* With all major details in place, we commercially printed five thousand announcement fliers and four hundred admission tickets. The fliers included a tear-off registration form. (Copies of the flier may be obtained from Jerry Resnick at the address given above. Please send stamped, self-addressed envelope.) We asked registrants to include a self-addressed envelope with their fee—a precaution that saved our registration chairperson much time. This individual devoted much time and effort in the preparation of lists of registrants and their addresses. These were useful at the door for admitting individuals who had mislaid their tickets and for the later compilation of a card file.

The flier provided such information as the site and its address, date, time, names of speakers, topics to be discussed, and registration details. It also included the name and phone number of one of the cochairpersons, to whom questions could be addressed. The flier also specified that the program *would not include a debate.* Instead, briefly stated questions would be answered by a panel of the speakers during a question-and-answer period.

5. *Arrange for publicity.* All SCONYC organizations mailed fliers to their members. We inserted notices in journals of national and state science teacher associations and sent fliers to the New York Academy of Sciences. We publicized the symposium at the national convention of the National Association of Biology Teachers held in Boston, and at an upstate meeting of science teachers. We mailed fliers to heads of the physical and biological science departments of nearby colleges and high schools. Heads of the science-education departments of nearby universities, four-year colleges, and community colleges were also on our mailing list. Personal phone calls supplemented the mailings when one of us knew a contact person. We asked school superintendents to publicize this educational

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

meeting within their districts. And, of most importance, we sent repeat mailings.

We were not effective with the media. We desired media coverage not for advance publicity but rather to disseminate some of the ideas developed at the symposium to the public, to scientists, and to science educators. To this end, we telephoned and wrote to the science editors and education editors of our major newspapers explaining why this would be a newsworthy event for them to cover. However, despite the stereotype of the reporter as an intrepid newshound, none would venture forth on a cold Saturday morning! Now we realize that we should have provided a news release in advance and made a personal visit. One editor, however, does plan to do a piece concerning our symposium and the burgeoning anti-creationist movement.

6. *Provide the speakers with complete program details.* Two weeks before D-day, we sent each speaker a detailed outline of the program, including the time schedule. In reminding each speaker of his specific topic, we also suggested specific points or questions for inclusion. We also provided a response form to solicit biographical data, visual-aid requirements, and miscellaneous suggestions.

7. *Make arrangements for food.* For us, this seemingly simple matter constituted our most agonizing and time-consuming problem. Our host institution could not adequately meet our needs on a Saturday. We feared that people wandering off in search of a restaurant might not return. Finally, we had a caterer provide an inexpensive box lunch for half the audience, and we directed the remainder to the cafeterias of two nearby hospitals. Had we not already printed the tickets, we would have notified this woodsy bunch of biologists to brown-bag it.

8. *Respond to criticism.* Several creationists and evolutionists wrote or phoned to complain that we did not have a creationist to present the opposing view. As part of our letter of response, we said: "We felt that we could make better use of the limited time available by an overall, dispassionate analysis rather than by a debate-type confrontation of a kind that often becomes enmeshed in a few, possibly trivial aspects. Oratorical displays are often more obfuscating than illuminating." We also pointed out that one speaker's task was to attempt an honest, point-by-point comparison of the competing arguments. Finally, we stated that the program provided for a question-and-answer period, and we hoped the questioner would obtain new insights from the program.

We believe that our cordial and frank response to criticism and our eliciting of questions from creationists during the open-forum segment of the program provided a wholesome atmosphere. The moderator also made a point of welcoming those in the audience who held creationist views.

The Meeting

Meticulous planning, faithful execution of assignments by committee members,

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

and full cooperation by personnel of the host institution caused the symposium to run smoothly (except for slight chaos at lunchtime). Fortunately, we had selected an overall coordinator for the meeting. This individual met early with the working committee and student assistants to direct them to their assigned posts. The coordinator greeted the speakers and honored guests and ushered them to an alcove where they could meet informally before the program began. He also opened the meeting, gave directions at lunchtime, started the afternoon session, and served as general dispenser of information. We should have had two guides, fitted with colored armbands.

We had a few pleasant surprises. Charlotte Frank, executive director of the Division of Curriculum and Instruction of the New York City Board of Education, read a statement supporting the teaching of modern evolution theory in the science curriculum. Charles C. "Spike" Brooks, an unexpected visitor from Atlanta, Georgia, exhilarated us with stories of his experiences in that state. Catherine A. Callaghan, associate professor of linguistics at Ohio State University and a Ohio anthropologist, brought copies of her *American Biology Teacher* article, which details evolutionist answers to twenty creationist arguments.

Evaluation

The final step for us pedagogues, of course, was evaluation. This took place at a euphoric Dutch-treat dinner for the symposium committee. An analysis of the symposium questionnaires disclosed that this single meeting had converted nobody: Evolutionists remained evolutionists and creationists remained creationists. This did not surprise us; individuals willing to devote a day-off to a discussion of this topic must already be strongly committed. However, we were gratified to learn that 25 percent of the creationists who responded thought we had been quite fair in our presentation of their views. Half of the people said that they had learned much from the updating in evolution theory.

If we had changed so few minds, what were the values of the symposium? Some were tangible, others intangible. One tangible outcome was the development of a card file of people in our state who want to become involved in an action program. We are sorting the cards so that they can be pulled by city, county, and school. We are building a communications network of people who can organize a letter-writing campaign in their schools or localities, and who can fill bus-loads of colleagues to visit the legislature while it is in session. We have names of volunteers to serve on a steering committee that will coordinate the efforts of scientists, educators, clergymen, lawyers, and parents.

We had thirty-two registrants from New Jersey and ten from Connecticut. We designated separate areas for these people to find their colleagues and begin organizing themselves. If people from our sister states did get a start, we claim

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

this fringe benefit as an additional tangible outcome.

An intangible outcome of the symposium was the sense of cohesiveness developed in individuals who, already aware of the creationist threat, were seeking a means of moderate personal involvement. Also, our five thousand fliers and the potential newspaper publicity are alerting somnolent scientists, science teachers, and laypersons to the threat to vitiate the scientific process and to crumble the barrier between church and state.

If you should organize a symposium in your city, such a rally of cohorts will provide *esprit*, cohesiveness, and direction to those who are making lonesome efforts in defense of their most cherished goals. They are out there, awaiting your call.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

Future Issues You Won't Want to Miss!

Contributions of articles to *Creation/Evolution* are coming in from all over the country. Authors who are knowledgeable in some specific area of creationist attack are lending their expertise to the effort of answering creationist arguments. Here, then, are just a few of the subjects future issues will cover:

- Why do creationists reject evolution but support modern physics? Robert Price will clear up this strange paradox in, "The Old-Time Religion and the New Physics."
- How can we effectively answer the sensationalist reports that Noah's Ark actually rests on Mt. Ararat? Rober A. Moore will show us by demonstrating that creationist "arkeology" abandons the scientific approach.
- Have all the radiometric clocks been reset by nature, as creationists contend? Chris Weber will show how modern dating methods continue to be reliable.

Other articles will expose the falacies in the creationist claim that humans walked with dinosaurs along the Paluxy River. Leading scientists who have been quoted by creationists as providing evidence against evolution will speak out and reveal how they have been misrepresented. And details will be presented to show why the whole creation approach, at the root, is unscientific. But there's still more—in fact, too much to list.

Please stay with us. Renew your subscription now to ensure you won't miss a single issue of *Creation/Evolution*. Use the coupon below.

. . . . . .

Yes, I want to renew my subscription to *Creation/Evolution* now, to make sure I don't miss a single issue. I understand that you will see to it that I get every issue due me, even though I might be renewing early. And, if I'm a little late, I know you'll ensure there is no gap in my collection.

I enclose $_____ for _____ subscriptions at $8.00 each ($9.00 for Canadian and Mexican addresses; $13.00 for foreign air mail). I understand there are four issues per year.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please send a gift subscription to the following friend or opinion leader; my check is enclosed:

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Creation/Evolution
P.O. Box 5 • Amherst Branch • Buffalo, NY 14226

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED

CREATION/EVOLUTION
Box 5, Amherst Branch
Buffalo, New York 14226

CREATION/EVOLUTION is the only journal that answers the arguments raised by creationists. The editors encourage your use of this material. If you wish to distribute copie sof the journal to legislators, school boards, students, or others, they are available in bulk. Ten copies or more of the same issue will be sent to you postpaid for only $1.50 per copy. Normal subscription rate is four issues for $8.00. Single back or current issues are $2.50 each.

LICENSED TO UNZ.ORG
ELECTRONIC REPRODUCTION PROHIBITED